

EXHIBIT B. CLEANUP ACTION PLAN



FINAL CLEANUP ACTION PLAN

South Wilbur Petroleum Contamination Site
Wilbur, WA

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Washington Department of Ecology
Toxics Cleanup Program
Eastern Regional Office
Spokane, WA

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1.0 INTRODUCTION

This report presents the Washington State Department of Ecology's proposed cleanup action for the South Wilbur Petroleum Contamination Site (Site), located in the area of the intersection of Front Avenue and Anne Street, just south of downtown Wilbur, Lincoln County, Washington (Figure 1). This Cleanup Action Plan (CAP) is required as part of the site cleanup process under the Model Toxics Control Act (MTCA), Ch. 70.105D RCW, implemented by the Washington State Department of Ecology (Ecology). The cleanup action decision is based on the Remedial Investigation/Feasibility Study (RI/FS) and other relevant documents in the administrative record.

This CAP outlines the following:

- The history of operations, ownership, and activities at the Site;
- The nature and extent of contamination as presented in the RI;
- Cleanup levels for the Site that are protective of human health and the environment;
- The selected remedial action for the Site; and
- Any compliance monitoring and institutional controls that are required.

1.1 DECLARATION

Ecology has selected this remedy because it will be protective of human health and the environment. Furthermore, the selected remedy is consistent with the preference of the State of Washington as stated in RCW 70.105D.030(1)(b) for permanent solutions.

1.2 APPLICABILITY

Cleanup levels specified in this cleanup action plan are applicable only to the South Wilbur Petroleum Contamination Site. They were developed as a part of an overall remediation process under Ecology oversight using the authority of MTCA, and should not be considered as setting precedents for other sites.

1.3 ADMINISTRATIVE RECORD

The documents used to make the decisions discussed in this cleanup action plan are on file in the administrative record for the Site. Major documents are listed in the reference section. The entire administrative record for the Site is available for public review by appointment at Ecology's Eastern Regional Office, located at N. 4601 Monroe Street, Spokane, WA 99205-1295.

1.4 PREVIOUS WORK

The CAP presents a brief description and history of the South Wilbur Petroleum Contamination Site. Results from applicable studies and reports are summarized to provide background information pertinent to the CAP. These studies and reports include:

- Final Remedial Investigation/Feasibility Study (CH2MHill, 2002)
- Summary of Environmental Investigations, Washington State Department of Transportation, Old Wilbur Maintenance Facility, Wilbur, Washington (IT Corporation, 2000)
- Site Characterization with Geoprobe for the Washington State Department of Transportation Old Wilbur Maintenance Facility (WSDOT, 1998)
- Additional Site Characterization: Washington State Department of Transportation Old Wilbur Maintenance Facility (WSDOT, 1997)
- Site Characterization: Washington State Department of Transportation Old Wilbur Maintenance Facility (WSDOT, 1997)

2.0 SITE BACKGROUND

2.1 SITE HISTORY

The Site is located approximately one block south of downtown Wilbur, WA in Lincoln County (figure 1). It is comprised of three separate properties: the former Washington State Department of Transportation (WSDOT) Maintenance Facility, the Lincoln County Maintenance Facility, and the former Lincoln Mutual No. 3 fueling station. It is bounded to the north by Goose Creek, to the west by the Town Park, to the south by Front Avenue and a railroad yard, and to the east by Brace Street.

WSDOT operated its maintenance facility from the 1930s through the early 1970s, when major maintenance activities moved to Davenport. Major activities included vehicle maintenance, fueling, and storage of road maintenance supplies. By 1996, all remaining equipment and personnel had been relocated to a different facility, and the Town of Wilbur leased the property for equipment storage. Diesel fuel was stored in one 1,000 gallon underground storage tank (UST) and one 1,100 gallon aboveground storage tank (AST), while gasoline was stored in one 1,000-gallon UST. These tanks were decommissioned and removed in June 1991. An additional 5,000-gallon AST was used for storage of asphalt, and the now empty AST is still present on-site. In addition, a dry well, receiving liquids from a sump in the shop, was located just north of the shop building (CH2MHill, 2002). In 2001, the site was purchased by Lincoln County.

The Lincoln County maintenance facility was in operation from the 1930s through the present. Site activities were similar to the WSDOT facility, including vehicle fueling and maintenance and supply storage. Four USTs were located on the site, including an 8,000 gallon diesel UST, a 500 gallon waste oil UST, and two 500 gallon unleaded gasoline USTs. All of these tanks were decommissioned and removed between 1990 and 1992.

The former Lincoln Mutual No. 3 property was the location of a fueling station, and is estimated from aerial photographs to have operated from the 1950s through the 1980s. The site contained a fueling island, a 1,900 gallon diesel AST, and is inferred from photographs to have had two USTs near the fueling island. Fueling operations were discontinued prior to purchase by the present owners. Currently, the site building is used as office space and the surrounding land is now paved and used for parking. Figure 1 shows the locations of all properties and approximate locations of tanks or petroleum discharges.

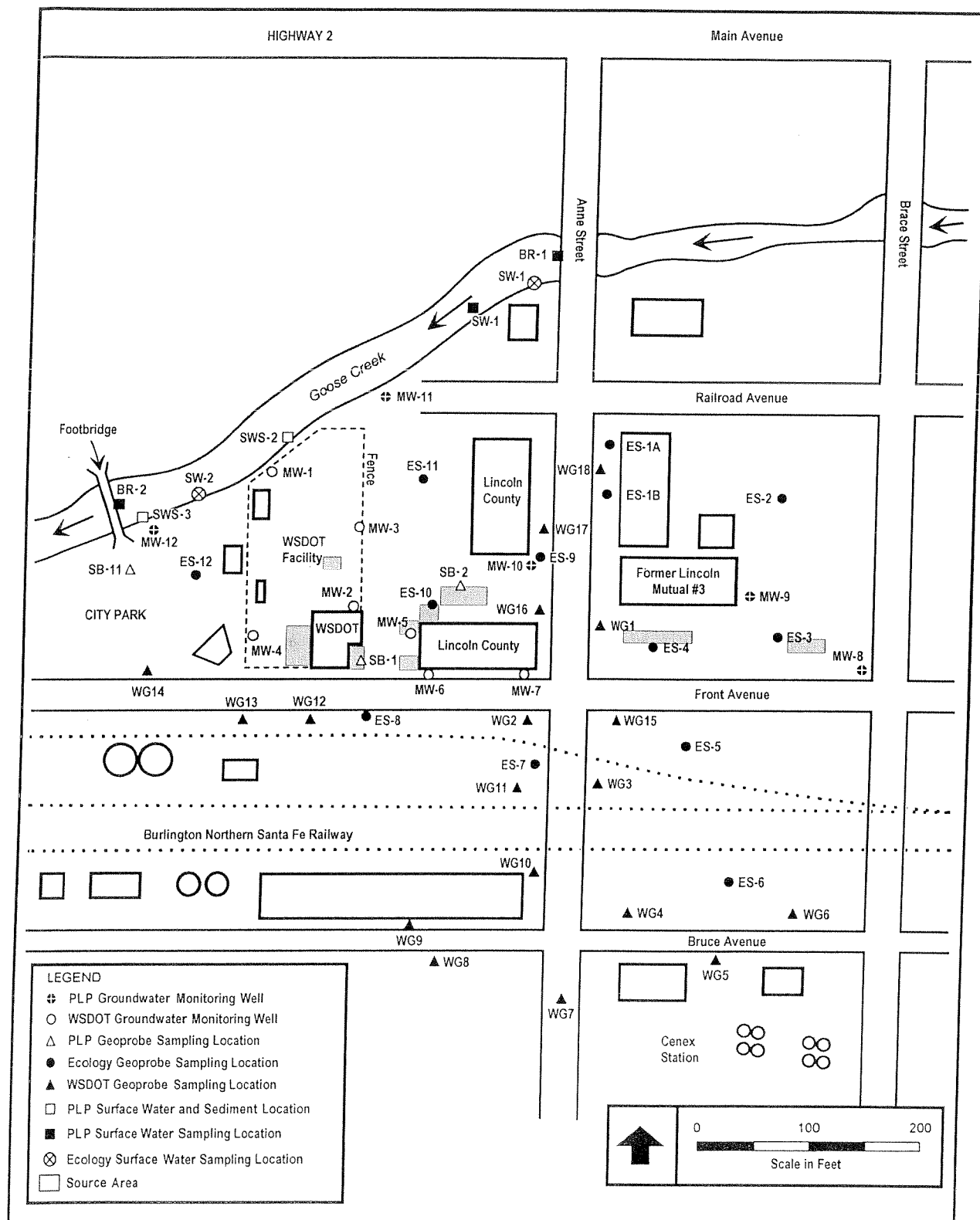


Figure 1. Site Map

2.2 SITE INVESTIGATIONS

A series of investigations have taken place to aid in determining the type, amount, extent, and source of the petroleum hydrocarbon contamination. The following chronologically lists the separate activities and investigations that have taken place at the three properties. Reports documenting these investigations can be found at Ecology's Eastern Regional Office in Spokane.

In 1990, three USTs on the Lincoln County maintenance facility property, two 1000 gallon unleaded gasoline and one 500 gallon waste oil, were decommissioned. It is not known if there were releases related to these tanks. In 1992, the Lincoln County Highway Department removed one 8,000 gallon diesel UST. Soil samples that were collected from the excavation showed that diesel and BTEX compounds were not present above cleanup levels.

The WSDOT property was first investigated in June 1991, when a cleanup action report was submitted for the removal of 5 cubic yards of petroleum contaminated soil. The soil was discovered during the removal of a 1000 gallon gasoline UST and a 1000 gallon diesel UST. It was also noted in a June 1992 WSDOT investigation that a sump in the shop building was full of oily water.

In 1995, the Lincoln County Highway Department completed a limited Phase II Investigation on four Lincoln County maintenance facility properties, including the one in Wilbur. The investigation was intended to investigate potential petroleum contamination related to activities at each facility's wash pad. Results for the Wilbur site showed that adjacent to and just below the asphalt, to a depth of one foot below ground surface, no petroleum contamination was present.

In February 1995, a Phase I and Phase II Environmental Site Assessment was completed for the WSDOT property to determine potential sources and possible extent of contamination at the site. Further activities were conducted to locate the drywell that was connected to the sump, and samples were collected to determine the nature of the contaminants. The drywell was excavated in October of 1996 and the majority of contaminated soil was removed, however gasoline contamination was still present in the bottom and north wall of the excavation.

In July 1996, the WSDOT performed a soil and groundwater investigation based on the results of the Phase I and II site assessment. Four monitoring wells were installed on-site to assess the quality of subsurface materials. Soil and groundwater samples were collected, and results indicated that soil was contaminated with gasoline to a depth of around 15 feet, and groundwater had concentrations of gasoline, and benzene, toluene, ethyl-benzene, and xylene (BTEX) exceeding cleanup levels.

Because of the nature of surrounding businesses, the WSDOT completed a second site characterization in May 1997 to investigate the extent of petroleum contamination. Three additional monitoring wells were installed on the Lincoln County maintenance facility property, and soil and groundwater samples were again collected. Results showed soil exceedances for gasoline, benzene, and xylene. Groundwater again showed levels of gasoline and BTEX compounds exceeding cleanup levels, and additionally diesel had one exceedance.

A third investigation was undertaken by WSDOT because the plume appeared to be larger than originally thought. A geoprobe was used to investigate areas upgradient of both properties. Groundwater and soil results again showed soil contaminated with gasoline and xylene, and groundwater contaminated with gasoline, benzene, toluene, and xylene. Areas shown to be impacted were located to the southeast and east of the site.

In 1999, Ecology completed a limited site investigation of the WSDOT property, the Lincoln County property, and the former Lincoln Mutual #3 property which lies upgradient of the two maintenance facilities. A strataprobe was used to install several soil borings surrounding the WSDOT property, with the majority being installed upgradient of both maintenance facilities to help characterize other potential sources. Soil sampling showed that gasoline contamination was present at depths greater than 8 feet. Groundwater samples had concentrations of gasoline, diesel, and BTEX compounds in various combinations exceeding cleanup levels.

A Remedial Investigation/Feasibility Study (RI/FS) was completed in 2001 by consultants to Lincoln County. The RI/FS further evaluated the nature and extent of soil and groundwater contamination at all three properties comprising the site. Samples were taken primarily from the three properties and areas immediately adjacent to the properties. Eight soil borings were installed, and soil samples were taken from several depths in these borings. Five of the eight borings were completed as temporary monitoring wells, and representative groundwater samples were taken. In addition, three surface water samples were collected from Goose Creek at locations bordering the site.

2.3 PHYSICAL SITE CHARACTERISTICS

2.3.1 Topography and Climate

The site is at an elevation of around 2150 feet and is relatively flat, with little elevation change from the northern site boundary to several blocks south of the site. Beyond that, the elevation changes rapidly, gaining 40 feet in elevation over a 200 foot distance. This embankment represents a division from the industrial/commercial area along the creek to the more residential area to the south. The creek itself runs in a ravine about 10 feet below site elevation.

The region is semi-arid, receiving between 10 and 15 inches of precipitation annually. The majority of the precipitation occurs in winter and early spring in the form of snow. The annual mean temperature is about 50°F.

2.3.2 Regional Geology

The geology in the vicinity of the site consists of Wanapum Basalt, a subgroup of the Columbia River Basalt. It ranges from 200 to 400 feet in thickness and is Miocene in age. (CH2MHill, 2002) In the vicinity of the site, they are approximately 200 feet thick. These basalts are overlain by variable thicknesses of alluvium and/or loess.

2.3.3 Hydrogeology

The main groundwater producing unit is the Wanapum Basalt, where groundwater flows through joints, fractures, and interflows. Local water supply wells receive water from this unit, and flow is artesian in many places. Overlying the basalt in the vicinity of the site is a unit of saturated silts and clays. These materials have a higher permeability than the basalt below, but still are relatively impermeable compared to other unconsolidated aquifer materials. The range of hydraulic conductivities is estimated to be 3×10^{-4} ft/s to 1.5×10^{-4} ft/s. These correspond roughly to that of a silty sand. Groundwater in the shallow aquifer is not considered a source of drinking water because of its low hydraulic conductivity and low water quality. Hydraulic gradient at the site is fairly shallow, having been measured at approximately 0.004 ft/ft. Groundwater flows generally towards Goose Creek, with some slight variation in the angle depending on the season. In times of extremely high water in the creek, the flow can decrease significantly or even temporarily reverse such that water from Goose Creek recharges the groundwater system.

3.0 NATURE AND EXTENT OF CONTAMINATION

3.1 SOIL

Soil has been contaminated with petroleum compounds down to bedrock at all three properties. It is unknown exactly how much soil on each property is affected. Originally, petroleum contamination was located very near to the source of the release. Due to the low conductivity of the soils, movement occurred quite slowly. Precipitation infiltration caused petroleum contamination to move and spread, causing more soil to become contaminated and eventually contaminating groundwater. Over time, numerous releases from different facilities moved, spread, and overlapped, resulting in a plume of contaminated soil that varies in concentration and extent. Because soil contamination investigations only take samples at specific locations within the plume, it is difficult to estimate the exact size and nature of the plume.

Soil investigations have shown maximum gasoline concentrations at several thousand parts per million (ppm), maximum diesel at 6500 ppm, and concentrations of the petroleum components benzene, toluene, ethyl benzene, and xylene (BTEX) all significantly exceeding cleanup levels. Soil was analyzed for lead since the facilities were in operation during the time when leaded gasoline could have been used. However, soil results did not show the presence of lead.

3.2 GROUNDWATER

Groundwater has been contaminated by petroleum compounds from releases at all three facilities. Petroleum releases from underground storage tanks and other surface disposal have migrated down through the soil column and into groundwater. Groundwater plumes from releases at all three facilities moved and mixed into one commingled plume. Due to the nature of groundwater, more mixing occurs so contaminant concentrations are slightly more evenly dispersed than in soil.

Groundwater investigations have focused on measuring the areal extent of the plume and the nature of the contamination. Historical data is available from the seven wells on the WSDOT

and Lincoln County properties, and recent data is from all twelve monitoring wells on the site. Gasoline concentrations were over 100 ppm, diesel concentrations were almost 2000 ppm, and BTEX compounds were all well in exceedance of groundwater cleanup standards. Lead was again tested because of the possible presence of leaded gasoline, but none was detected in any groundwater samples.

3.3 SURFACE WATER AND SEDIMENT

Goose Creek flows immediately adjacent to two of the three properties that comprise the site. The primary source of water for the creek is precipitation and surface runoff. Also, the shallow groundwater system supplies base flow to Goose Creek throughout most of the year. Flow is typically highest in the spring after snowmelt, and lowest in late summer.

Surface water has been tested twice during investigations at this site, once by Ecology and once during the RI/FS. During the study by Ecology, two locations were sampled, one upstream and one downstream of the site. The RI/FS sampled five locations along the creek, two upstream and three downstream. Two of those sites also had sediment samples collected from them. Sediment samples were collected from the bank adjacent to the site. Results of both investigations showed no detections of gasoline, diesel, or BTEX compounds in surface water or sediment. Therefore, there are no indicators or cleanup levels set for surface water or sediment.

3.4 RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

The Site is composed of commercial-use properties with no anticipated future change of use. However, the WSDOT property is immediately adjacent to the city park which is host to numerous community activities including an annual fishing derby for children. Site groundwater discharges into Goose Creek. Although it is a Class B stream and is not considered a source of potable drinking water, it still has limited recreational and irrigation use. Also, the Lincoln County and Lincoln Mutual #3 properties are unfenced and open to passersby.

Exposures to human populations could occur through contact with contaminated surface or subsurface soils, groundwater, or surface water. These populations include on-site workers, passersby to the properties, and recreational users of the park and creek.

4.0 CLEANUP STANDARDS

MTCA requires the establishment of cleanup standards for individual sites. The two primary components of cleanup standards are cleanup levels and points of compliance. Cleanup levels determine the concentration at which a substance does not threaten human health or the environment. All media that exceeds a cleanup level is addressed through a remedy that prevents exposure to the media. Points of compliance represent the locations on the site where cleanup levels must be met.

4.1 OVERVIEW

The process for establishing cleanup levels involves the following:

- determining which method to use;
- developing cleanup levels for individual contaminants in each media;
- determining which contaminants contribute the majority of the overall risk (indicators) in each media; and
- adjusting the cleanup levels downward based on total site risk.

The MTCA Cleanup Regulation provides three options for establishing cleanup levels: Methods A, B, and C.

- Method A may be used to establish cleanup levels at routine sites or sites with relatively few hazardous substances.
- Method B is the standard method for establishing cleanup levels and may be used to establish cleanup levels at any site.
- Method C is a conditional method used when a cleanup level under Method A or B is technically impossible to achieve or may cause significantly greater environmental harm. Method C also may be applied to qualifying industrial properties.

The MTCA Cleanup Regulation defines the factors used to determine whether a substance should be retained as an indicator for the Site. When defining cleanup levels at a site contaminated with several hazardous substances, Ecology may eliminate from consideration those contaminants that contribute a small percentage of the overall threat to human health and the environment. WAC 173-340-703(2) provides that a substance may be eliminated from further consideration based on:

- The toxicological characteristics of the substance which govern its ability to adversely affect human health or the environment relative to the concentration of the hazardous substance;
- The chemical and physical characteristics of the substance which govern its tendency to persist in the environment and through the environment;
- The chemical and physical characteristics of the substance which govern its tendency to move into and through the environment;
- The natural background concentration of the substance;
- The concentration of the substance at the site;
- The frequency of detection.

4.2 SITE CLEANUP LEVELS

The RI/FS has documented the presence of contamination in groundwater and soil at the Site. Cleanup levels will be developed for these media. Since the groundwater is nonpotable, these cleanup levels are established under the criteria of WAC 173-340-720(6).

Under WAC 173-340-704(1), Method A may be used at a site that is undergoing a routine cleanup action. Since the site has a relatively small number of contaminants with obvious cleanup levels and no environmental impact statement or ecological evaluation is required, Method A cleanup levels will be used at the site.

Tables 1 and 2 show the indicator substance screening of analytes for which Site soil and groundwater were tested.

4.3 POINT OF COMPLIANCE

The MTCA Cleanup Regulation defines the point of compliance as the point or points where cleanup levels shall be attained. Once cleanup levels are met at the point of compliance, the Site is no longer considered a threat to human health or the environment.

The point of compliance for groundwater is defined in WAC 173-340-720(8). Groundwater points of compliance are established for the entire Site from the top of the saturated zone to the lowest affected portion of the aquifer, which is bedrock at this Site. At this Site, it is practicable to meet cleanup levels using a standard point of compliance.

WAC 173-340-740(6) gives the point of compliance requirements for soil. For sites where cleanup levels are based on the protection of groundwater, the point of compliance is established in all soils throughout the site. The Method A cleanup levels for petroleum and BTEX compounds are based on the protection of groundwater, so this point of compliance will apply.

5.0 CLEANUP ACTION SELECTION

5.1 REMEDIAL ACTION OBJECTIVES

The remedial action objectives are statements describing the actions necessary to protect human health and the environment through eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route. They are developed considering the characteristics of the contaminated medium, the characteristics of the hazardous substances present, migration and exposure pathways, and potential receptor points.

Groundwater and soil have been contaminated by the former Site activities. People may be exposed to contaminated groundwater via ingestion, inhalation of volatile chemicals, or dermal contact. Soil exposure would occur through dermal contact or inhalation of dust. Potential populations include on-site workers, trespassers, residents of nearby neighborhoods, passersby, and off-site workers.

Given these potential exposure pathways, the following are the remedial action objectives for the Site:

- Prevent or minimize direct contact or ingestion of contaminated soil by humans
- Prevent or minimize direct contact or ingestion of contaminated groundwater by humans
- Prevent or minimize further contamination of groundwater
- Protect beneficial uses of Goose Creek